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ON THE PRODUCTION OF CITRIC ACID BY FERMENTATION.

Dr. Carl Wehmer, privat docent at the Technical High School of Hanover, claims to have discovered two new hyphomycetous fungi capable of transforming sugar into citric acid by fermentation. The process consists in adding to a solution of sugar 2 to 5 per cent. of citric acid, allowing a fungus to develop spontaneously thereon for a few days, transplanting said fungus to a sterilized sugar solution, and subsequently adding portions of the growth to large quantities of a sugar solution containing a little ammonium nitrate, potassium phosphate, and magnesium sulfate. The liquid is then allowed to stand at the ordinary temperature for from eight to fourteen days, when the dilute solution of citric acid formed may be employed like lemon juice, or may be concentrated and separated as a lime salt.

The fungi are closely allied to *Aspergillus*, but are placed by the author in a new genus containing two species, *Citromyces Pfefferianus* and *glaber*. The first species forms long, green, loose flocks, often sterile, or cushions with whitish edges; the second forms a green layer, with abundance of fruit, and is a more energetic acid-former than the first.

C. Pfefferianus: Sterile hyphæ hyaline, septate, creeping or erect, branched, fertile hyphæ simple or branched, more or less septate, $\pm 70\mu \sim 3\mu$, apex club-shaped or much inflated, $4-8\mu$ diameter, sterigmata simple, hyaline (5-10) apex acute, $9-14\mu \sim 2-4\mu$, heads of conidia penicilliform, conidia globose, in chains, crowded above, light green, then ashy, $2.5-3\mu$ diameter, Perithecia? if known, white or pale, globose $2-9\mu$ diameter.

Found on putrescent substances, as citrus fruits, in solutions of sugar and citric acid. Leipzig, Hanover, Alsace.

C. glaber is similar to the preceding, but forms a thick, smooth, dark-green superficial layer, producing conidia in large masses, raised above the surface. When grown on boiled rice a yellow color is formed.

The above adds another to the processes now known in which chemical changes are produced by or depend on organic ferments. One of the most interesting of these is the process for producing lactic acid discovered by Charles E. Avery, of Boston, Massachusetts, by which many tons of lactic acid have been made from corn-meal, starch, etc., without the use of casein or other animal matter usually stated in the text-books to be necessary.

W. H. S.